

What is claimed is:

1. A computing device, comprising:
 - a first member having a first structural element and a first conductive element;
 - a second member having a second structural element and a second conductive element; and
 - a means for electrically and structurally coupling the elements of the first and second members together.
- 10 2. The computing device as recited in claim 1 wherein the means for electrically and structurally coupling the elements of the first and second members together forms a singular composite structure that both supports the computing device and shields the computing device from electronic emissions.
- 15 3. The computing device as recited in claim 2 wherein the singular composite structure is used to enclose internal components of the computing device.
4. The computing device as recited in claim 1 wherein the means has a liquid state for flowing between the first and second members, and a solid state for 20 permanently attaching itself to the first and second members.
5. The computing device as recited in claim 4 wherein the means includes a structural glue and a conductive paste.
- 25 6. The computing device as recited in claim 5 wherein the structural glue is arranged to structurally attach the structural elements of the first and second members, and wherein the conductive paste is arranged to electrically connect the conductive members of the first and second members.
- 30 7. The computing device as recited in claim 6 wherein the structural glue is arranged to fill a gap between the structural elements of the first and second members, and wherein the conductive paste is arranged to seal an interface between the conductive elements of the first and second members.

8. The computing device as recited in claim 1 wherein the first member is formed from a conductive material, wherein the second member is formed from a non-conductive material, and wherein the conductive element of the second member is a conductive layer that is formed on the structural element of the second member.

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9. A component of a computer enclosure, comprising:

a first structural member;
a second structural member;

an adhesive disposed between the first and second members, the adhesive structurally attaching the first and second members to form a singular composite structure.

10. The component as recited in claim 1 wherein the adhesive is arranged to absorb geometric variations found in the frame or casing so as to meet a predetermined geometry of the component.

11. The component as recited in claim 1 wherein the adhesive is a glue, wherein the casing and the frame are arranged to provide a gap therebetween for the placement of the glue, and wherein glue conforms to the gap to reduce tolerance variability in the glued component.

20. 12. The component as recited in claim 11 wherein the glue has a compliant state arranged for filling the gap, and wherein the glue has a rigid state for structurally binding the first and second members together.

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13. The component as recited in claim 12 wherein the glue is a two part epoxy.

14. The component as recited in claim 9 wherein the adhesive substantially eliminates the use of mechanical fasteners, which are used to attach the first and second members.

30. 15. The component as recited in claim 9 wherein the first member is formed from a first material, and wherein the second member is formed from a second material that is different than the first material.

16. The component as recited in claim 9 wherein the first member is formed from a plastic material, and wherein the second member is formed from a metallic material.

5 17. The component as recited in claim 9 wherein the first member is a casing, wherein the second member is a frame for supporting the casing, and wherein the casing and the frame are configured to at least partially enclose parts of a computing device.

10 18. The component as recited in claim 9 wherein a first surface of the first member is configured to be flush with a second surface of the second member.

19. The component as recited in claim 9 wherein a first surface of the first member is configured to be offset from a second surface of the second member.

15 20. A component of a computer enclosure comprising:
a first member having a first conductive surface;
a second member having a second conductive surface;
a conductive bridge electrically connecting the first and second conductive surfaces and electrically sealing an interface between the first and second conductive surfaces so as to form a singular conductive structure for shielding electronic emissions.

20 21. The component as recited in claim 20 wherein the conductive bridge is a conductive paste.

22. The component as recited in claim 21 wherein the conductive paste has a compliant state arranged for sealing the interface, and a rigid state for electrically bonding the conductive surfaces of the first and second members together.

30 23. The component as recited in claim 22 wherein the conductive paste is a metal filled electrically conductive ink.

24. The component as recited in claim 20 wherein the first member is formed from a first material, and wherein the second member is formed from a second material that is different than the first material.

5 25. The component as recited in claim 24 wherein the first member is formed from a conductive material, wherein the second member is formed from a non-conductive material that is selectively coated with a conductive layer, and wherein the conductive bridge electrically connects and electrically seals an interface between the conductive material of the first member and the conductive layer of the second
10 member.

26. The component as recited in claim 25 wherein the first member is formed from a first metallic material, wherein the second member is formed from a plastic material, and wherein the conductive layer is formed from a second metallic material.

15 27. The component as recited in claim 26 wherein the plastic material is a carbon fiber plastic, the second metallic material is a nickel plated layer, and the metallic material is titanium sheet metal.

20 28. The component as recited in claim 27 wherein the conductive bridge is formed from a nickel filled electrically conductive ink.

25 29. The component as recited in claim 28 wherein the nickel filled electrically conductive ink has viscosity between about 5000 centipoise to about 10000 centipoise.

30. The component as recited in claim 20 wherein the first member is a casing, wherein the second member is a frame for supporting the casing, and wherein the casing and the frame are configured to at least partially enclose parts of a computing device.

31. A portable computer enclosure, comprising:
a first case configured to at least partially enclose internal components of the portable computer, the first case including a first member formed from a first material

and a second member formed from a second material that is different than the first material, the first member being structurally glued to the second member to form a first composite structure, the glue having properties that allow it to compensate for tolerances in the first and second members so as to produce a desired first case dimension.

32. The enclosure as recited in claim 31 wherein the first case is configured to at least partially shield electronic emissions produced by the internal components, the first member being formed from a first conductive material, the second member being formed from a non-conductive material that is coated with a second conductive material that is different than the first conductive material, the interface between the first member and second member being electrically sealed via a conductive paste so as to shield the interface from electronic emissions.

15 33. The enclosure as recited in claim 31 further comprising:

a second case configured to mechanically cooperate with the first case to fully enclose internal components of the portable computer, the second case including a third member formed from a third material and a fourth member formed from a fourth material that is different than the third material, the third member being glued to the fourth member to form a second composite structure, the glue having properties that allow it to compensate for tolerances in the third and fourth members so as to produce a desired second case dimension,

20 wherein when the first and second cases mechanically cooperate with one another they form an enclosure having a predetermined geometry that is based at least in part on the desired first case dimension and the desired second case dimension.

25 34. The enclosure as recited in claim 31 wherein the first case is configured to at least partially shield electronic emissions produced by the internal components, the first member being formed from a first conductive material, the second member being formed from a non-conductive material that is coated with a second conductive material that is different than the first conductive material, the interface between the first member and second member being electrically sealed via a first conductive paste so as to shield the interface from electronic emissions, and

wherein the second case is configured to at least partially shield electronic emissions produced by the internal components, the third member being formed from a third conductive material, the fourth member being formed from a non-conductive material that is coated with a fourth conductive material that is different than the third

5 conductive material, the interface between the third member and fourth member being electrically sealed via a second conductive paste so as to shield the interface from electronic emissions.

35. The enclosure as recited in claim 34 wherein the second case is configured to

10 electrically cooperate with the first case to fully shield the electronic emissions produced by the internal components,

36. A method of forming a computer enclosure, comprising:

15 providing a casing and a frame;
structurally bonding the frame to the casing via glue; and
electrically bonding the frame to the casing via a conductive paste.

37. The method as recited in claim 36 wherein the step of structurally bonding the frame to the casing comprises:

20 dispensing the glue on the frame or the casing;
applying a force to sandwich the glue between the frame and the casing; and
allowing the glue to cure when the frame and casing are placed in a predetermined position relative to one another.

25 38. The method as recited in claim 36 wherein the step of electrically bonding the frame to the casing comprises:

dispensing the conductive paste on a first conductive surface of the frame or the casing;
flowing the conductive paste from the first conductive surface of the frame or casing to a second conductive surface of the frame or casing; and
allowing the conductive paste to cure so as to electrically seal an interface between the first and second conductive surfaces of the frame and casing.

39. A method of forming a computer enclosure by structurally bonding a first member to a second member, comprising:

dispensing a glue between the first and second members;

applying a force to sandwich the glue between the first and second members;

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allowing the glue to cure when the first and second members are placed in a predetermined position relative to one another so as to form a singular composite structure.

10 40. The method as recited in claim 39 wherein the step of dispensing the glue comprises:

placing the first fixture into a robotically controlled application tool configured for dispensing the glue along a predetermined path; and

robotically dispensing the glue on the first member.

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41. The method as recited in claim 40 wherein the step of applying a force, comprises:

placing the first member in a first fixture;

placing the second member in a second fixture; and

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clamping the first and second fixtures together so as to sandwich the glue between the first and second members.

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42. The method as recited in claim 41 wherein the first fixture is arranged to hold the first member in a fixed position relative to a first reference element of the first fixture, and wherein the second fixture is arranged to hold the second member in a fixed position relative to a second reference element of the second fixture.

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43. The method as recited in claim 42 wherein during placing of the first member a first portion of the first member is arranged to locate flush against a first datum surface of the first fixture, and wherein during placing of the second member a second portion of the second member is arranged to locate flush against a datum second surface of the second fixture.

44. The method as recited in claim 42 wherein the first and second fixtures are arranged to mate with each another so as to locate the first portion of the first member relative to the second portion of the second member.

5 45. The method as recited in claim 42 wherein the first and second fixtures place the first portion substantially flush with the second portion.

46. The method as recited in claim 42 wherein the first and second fixtures place the first portion in a predetermined offset position relative to the second portion.

10 47. The method as recited in claim 39 wherein the first and second members are arranged to form a gap for the placement of the glue.

15 48. The method as recited in claim 47 wherein the glue is arranged to absorb geometric variations found in the first and second members so as to meet a predetermined geometry of the single component structure.

20 49. The method as recited in claim 39 wherein the first member is formed from a first material, and wherein the second member is formed from a second material that is different than the first material.

50. A method of forming a computer enclosure by electrically bonding a first member to a second member, comprising:

25 dispensing a conductive paste on a first conductive surface of the first or second member;

flowing the conductive paste from the first conductive surface of the first or second member to a second conductive surface of the first or second member; and

allowing the conductive paste to cure so as to electrically seal an interface between the first and second conductive surfaces of the first or second member.

30 51. The method as recited in claim 50 wherein the conductive paste is dispensed along a predetermined path that corresponds to the area of desired electrical contact between the first and second members.

52. The method as recited in claim 50 wherein gravity is used to flow the conductive paste from the first conductive surface of the first or second member to the second conductive surface of the first or second member.

5 53. The method as recited in claim 50 wherein the conductive paste is a metal filled electrically conductive ink.

10 54. The method as recited in claim 50 wherein the first member is formed from a first material, and wherein the second member is formed from a second material that is different than the first material.

15 55. The method as recited in claim 54 wherein the first member is formed from a conductive material, wherein the second member is formed from a non-conductive material that is selectively coated with a conductive layer, and wherein the conductive paste electrically connects and electrically seals an interface between the conductive material of the first member and the conductive layer of the second member.

20 56. The method as recited in claim 50 wherein the step of dispensing is implemented in a robotically controlled application tool.